

Introduction to Probability Simulation and Gibbs Sampling with R

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Compilation of Errors in all Chapters

Page numbers refer to the the text. All corrections are scheduled to appear in the second printing. Statements of problems in the *Instructor Manual* have been corrected. This list includes corrections compiled through July 13, 2011.

- p12 *Example 1.5.* Just below printout $\pi = 0.80$ (not 0.30) in two places. Also, in the displayed equation for $P(\text{Cover})$, the term $P\{X = 19\}$, with value 0.0161, needs to be added to the beginning of the sum. [Thanks to Tarek Dib.] The correct display is:

$$\begin{aligned} P(\text{Cover}) &= P\{X = 19\} + P\{X = 20\} + P\{X = 21\} + \cdots + P\{X = 27\} \\ &= 0.0160 + 0.0355 + 0.0676 + \cdots + 0.0785 = 0.9463. \end{aligned}$$

- p18 *Problem 1.11(a).* Code `pbinom(x, 25, 0.3)` should be `pbinom(x, 30, 0.4)`.
p26 *Example 2.1.* In the first line below Figure 2.1: $r_i = 21$ should be $r_1 = 21$. [Thanks to Jeff Glickman.]
p74 *Problem 3.7.* Hint (a): R code `h = 12*g^3*(1-g)` should be `h = 12*g^2*(1-g)`.
p76 *Problem 3.11(b).* Should refer to Figure 3.10 (on the next page), not Figure 3.2. [Thanks to Leland Burrill.]
p84 *Problem 3.27(c).* The probability should be $P\{Z_1 > 0, Z_2 > 0, Z_1 + Z_2 < 1\}$. That is, the event should be restricted to the first quadrant.
p116 *Problem 4.26.* In the third line inside the loop of the program: The right parenthesis should immediately follow `repl=T`, not the comment. The correct line reads:

```
re.x = sample(x, B*n, repl=T) # resample from it
```

- p128 *Example 5.3.* In the second paragraph, change to: ...the value observed is a conditional random variable $X|\{S = s\} \sim \text{NORM}(s, 1)$.
p133 *Problem 5.6.* In the second paragraph, three instances of 2.5 should be 1.7. (For clarity, in the second printing, the first two paragraphs of the problem are to be revised as shown in this *Manual*.)
p148 *Example 6.2.* In the second line below printout, the transition probability should be $p_{01}(4) \approx 0.67$, not 0.69. [Thanks to Leland Burrill.]
p153 *Example 6.6.* In the displayed equation, the lower-right entry in first matrix should be 0.99, not 0.00. [Thanks to Tony Tran.] The correct display is as follows:

$$\mathbf{P} = \begin{bmatrix} 0.97 & 0.03 \\ 0.01 & 0.99 \end{bmatrix} \begin{bmatrix} 0.9998 & 0.0002 \\ 0.5976 & 0.4024 \end{bmatrix} = \begin{bmatrix} 0.9877 & 0.0123 \\ 0.6016 & 0.3984 \end{bmatrix}$$

- p155 *Problem 6.5(e).* The displayed equation should have 'mod 5'; consequently, the points should run from 1 through 5, and 0 should be adjacent to 4. The answer for part (e) should say: "The X -process is not Markov." The correct statement of part (e) is as follows:

e) At each step $n > 1$, a fair coin is tossed, and U_n takes the value -1 if the coin shows Tails and 1 if it shows Heads. Starting with $V_1 = 0$, the value of V_n for $n > 1$ is determined by

$$V_n = V_{n-1} + U_n \pmod{5}.$$

The process V_n is sometimes called a “random walk” on the points $0, 1, 2, 3$ and 4 , arranged around a circle (with 0 adjacent to 4). Finally, $X_n = 0$, if $V_n = 0$; otherwise $X_n = 1$.

p183 *Problem 7.4* In the program, the first statement after inner loop should read `a[j] = a - 1` (not `a`). The correct code is shown in this *Manual*. This error in the program makes a small difference in the histogram of Figure 7.14 (most notably, the first bar there is a little too short). A corrected figure is scheduled for the second printing; you will see it if you work the problem.

p208 *Problem 8.3(c)*. In two lines of the inner loop of the program code, the loop indices `i` and `j` should be reversed, to have `alpha[i]` and `beta[j]`. As a result of this error, values of alpha and beta inside parentheses are reversed in captions in Figure 8.6. [A corrected figure is scheduled for 2nd printing.] The correct inner loop is shown below and in Problem 8.3(c) of this *Manual*.

```
for (j in 1:5) {
  top = .2 + 1.2 * max(dbeta(c(.05, .2, .5, .8, .95),
    alpha[i], beta[j]))
  plot(x,dbeta(x, alpha[i], beta[j]),
    type="l", ylim=c(0, top), xlab="", ylab="",
    main=paste("BETA(",alpha[i],",", beta[j],")", sep="")) }
```

p214 *Problem 8.8(c)*. The second R statement should be `qgamma(.975, t+1, n)`, not `gamma(.975, t+1, n)`.

p221 *Example 9.1*. Just below displayed equations: The second factor of the second factor of the second term in the denominator of PVP γ is $(1 - \theta)$, not $(1 - \eta)$. The same equation on the previous page is correct, as is the program on p221.

$$\gamma = \pi\eta / [\pi\eta + (1 - \pi)(1 - \theta)]$$

p223 *Example 9.1*. Last paragraph: *Couil* should be *Coull*.

p230 The last three of the four displayed distributional relationships near the bottom of the page are incorrect. Correct statements are:

$$\begin{aligned} (\bar{x}_{..} - \mu) / \sqrt{MS(\text{Batch})/gr} &\sim T(g - 1), \\ (g - 1)MS(\text{Batch}) / (r\theta_A + \theta) &\sim \text{CHISQ}(g - 1), \\ (g(r - 1))MS(\text{Error}) / \theta &\sim \text{CHISQ}(g(r - 1)), \\ \sigma MS(\text{Batch}) / (r\sigma_A + \sigma)MS(\text{Error}) &\sim F(g - 1, g(r - 1)). \end{aligned}$$

p232 First displayed equation: In two places $+\sum_i A_i$ should be $+g\theta_0$. (In the program on the next page, the corresponding lines for `mu.up` and `th.up` are OK.) The correct equations follow:

$$\mu' = (\mu_0\theta_A + \theta_0 \sum_i A_i) / (\theta_A + g\sigma_0) \quad \text{and} \quad \theta' = \theta_0\theta_A / (\theta_A + g\theta_0)$$

- p239 *Problem 9.5(b)*. The vertical interval in the last line should be (0.020, 0.022).
- p240 *Problem 9.7*: In the R code, the `ylim` argument of the `hist` function should be `ylim=c(0, mx)`. The correct line of code is:

```
hist(PI[aft.burn], ylim=c(0, mx), prob=T, col="wheat")
```

- p240 *Problem 9.8(b)*. Add the following sentence:
Use the Agresti-Coull adjustment $t' = (A + 2)/(n + 4)$.
- p245 *Problem 9.16*. At the beginning of the second line of code, include the statement:
`df.Err = g*(r-1);`. [Thanks to Leland Burrill.]
- p245 *Problem 9.18*. The summary data printed by the program is usable, but does not correspond to seed 1237. [Figure 9.6 (p231) illustrates the data for seed 1237.]
The correct summary data are shown with the problem in this *Manual*.
- p246 *Problem 9.20(b)*. Notation for the prior on σ should be $\text{IG}(\beta_0 = 35, \lambda_0 = 0.25)$ to match the code in the program of Example 9.3.
- p281 *Section 11.2.2*. In the R code above the problems: Use vector `v5` instead of `w5` in both instances. [Thanks to Wenqi Zheng.] The correct line is;

```
> w5; w5[9]
```

- p285 *Problem 11.8*. The closed interval should be $[0, 1]$, not $[-1, 1]$. The related R code is correct. [Thanks to Tony Tran.]